2009

# Nebraska Summary S705: Massey Ferguson 5455 (S/N T022073 and higher)

Nebraska Tractor Test Lab
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# SUMMARY OF OECD TEST 2516–NEBRASKA SUMMARY 705
# MASSEY FERGUSON 5455 DIESEL
# 16 SPEED
## Tractor chassis S/N T022073 and higher

### POWER TAKE-OFF PERFORMANCE

| Power HP *(kW)* | Crank shaft speed rpm | Gal/hr *(l/h)* | lb/hp.hr *(kg/kW.h)* | Hp.hr/gal *(kW.h/l)* | Mean Atmospheric Conditions |
|---|---|---|---|---|---|
| **MAXIMUM POWER AND FUEL CONSUMPTION** | | | | | |
| **Rated Engine Speed—(PTO speed—1100 rpm)** | | | | | |
| 92.8 *(69.2)* | 2199 | 6.00 *(22.71)* | 0.461 *(0.280)* | 15.45 *(3.04)* | |
| **Standard Power Take-off Speed(1000 rpm)** | | | | | |
| 109.3 *(81.5)* | 2000 | 6.46 *(24.46)* | 0.421 *(0.256)* | 16.91 *(3.33)* | |
| **Maximum Power (1 hour)** | | | | | |
| 109.3 *(81.5)* | 2000 | 6.46 *(24.46)* | 0.421 *(0.256)* | 16.91 *(3.33)* | |
| **VARYING POWER AND FUEL CONSUMPTION** | | | | | |
| 92.8 *(69.2)* | 2199 | 6.00 *(22.71)* | 0.461 *(0.280)* | 15.45 *(3.04)* | Air temperature |
| 79.1 *(59.0)* | 2202 | 5.26 *(19.91)* | 0.473 *(0.288)* | 15.04 *(2.96)* | 70°F *(21°C)* |
| 59.5 *(44.4)* | 2213 | 4.45 *(16.84)* | 0.532 *(0.324)* | 13.37 *(2.63)* | Relative humidity |
| 40.0 *(29.8)* | 2227 | 3.39 *(12.82)* | 0.603 *(0.367)* | 11.81 *(2.33)* | 38% |
| 20.1 *(15.0)* | 2240 | 2.27 *(8.61)* | 0.803 *(0.489)* | 8.86 *(1.75)* | Barometer |
| -- -- | 2250 | 1.35 *(5.10)* | -- -- | -- -- | 29.7" Hg *(100.7 kPa)* |

Maximum torque - 355.7 lb.-ft. *(482.3 Nm)* at 1401 rpm
Maximum torque rise - 60.4%
Torque rise at 1750 engine rpm - 45%

### DRAWBAR PERFORMANCE
#### (Unballasted - Front Drive Engaged)
#### FUEL CONSUMPTION CHARACTERISTICS

| Power Hp *(kW)* | Drawbar pull lbs *(kN)* | Speed mph *(km/h)* | Crank-shaft speed rpm | Slip % | Fuel Consumption lb/hp.hr *(kg/kW.h)* | Fuel Consumption Hp.hr/gal *(kW.h/l)* | Temp.°F *(°C)* cool-ing med | Temp.°F *(°C)* Air dry bulb | Barom. inch Hg *(kPa)* |
|---|---|---|---|---|---|---|---|---|---|
| **Maximum Power—7th(2C) Gear** | | | | | | | | | |
| 67.7 *(50.5)* | 5530 *(24.6)* | 4.59 *(7.39)* | 2193 | 4.9 | 0.550 *(0.335)* | 12.89 *(2.54)* | 181 *(83)* | 45 *(7)* | 30.1 *(102.0)* |
| **75% of Pull at Maximum Power—7th(2C) Gear** | | | | | | | | | |
| 52.2 *(38.9)* | 4170 *(18.5)* | 4.69 *(7.55)* | 2205 | 3.5 | 0.605 *(0.368)* | 11.73 *(2.31)* | 180 *(82)* | 45 *(7)* | 30.1 *(102.0)* |
| **50% of Pull at Maximum Power—7th(2C) Gear** | | | | | | | | | |
| 35.4 *(26.4)* | 2775 *(12.3)* | 4.78 *(7.69)* | 2219 | 2.3 | 0.702 *(0.427)* | 10.10 *(1.99)* | 180 *(82)* | 45 *(7)* | 30.1 *(102.0)* |
| **75% of Pull at Reduced Engine Speed—8th(2D) Gear** | | | | | | | | | |
| 51.9 *(38.7)* | 4180 *(18.6)* | 4.66 *(7.51)* | 1779 | 3.2 | 0.523 *(0.318)* | 13.55 *(2.67)* | 178 *(81)* | 45 *(7)* | 30.1 *(102.0)* |
| **50% of Pull at Reduced Engine Speed—8th(2D) Gear** | | | | | | | | | |
| 35.1 *(26.2)* | 2765 *(12.3)* | 4.77 *(7.67)* | 1794 | 1.9 | 0.583 *(0.355)* | 12.17 *(2.40)* | 174 *(79)* | 45 *(7)* | 30.1 *(102.0)* |

**Location of tests:** Groupement d'Antony, Parc de Touvoie, BP 44 Antony, Cedex, France 92163
**Dates of tests:** December 2008 to March, 2009

**Manufacturer:** AGCO S.A. BP 307, Avenue Blaise Pascal, 60026 Beauvais, France

**FUEL and OIL: Fuel** No. 2 Diesel **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.855 **Fuel weight** 7.12 lbs/gal *(0.853 kg/l)* **Oil SAE** 15W40 **API service classification** CH4 **Transmission and hydraulic lubricant** BP Terrac Tractan 9 fluid **Front axle lubricant** API GL5 - SAE 85W140

**ENGINE: Make** Perkins Diesel **Type** four cylinder vertical with turbocharger and air to air intercooler **Serial No.** U021737S **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.134" x 5.000" *(105.0 mm x 127.0 mm)* **Compression ratio** 16.2 to 1 **Displacement** 268 cu in *(4400 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** thermostat and variable speed fan

**CHASSIS: Type** front wheel assist **Serial No.** T239091 **Tread width** rear 59.8" *(1518 mm)* to 67.0" *(1703 mm)* front 55.7" *(1415 mm)* to 64.8" *(1646 mm)* **Wheelbase** 97.0" *(2464 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (4) range operator controlled powershift **Nominal travel speeds mph** ***(km/h)*** first 1.32 *(2.12)* second 1.62 *(2.60)* third 1.97 *(3.17)* fourth 2.43 *(3.91)* fifth 3.11 *(5.01)* sixth 3.83 *(6.17)* seventh 4.68 *(7.53)* eighth 5.75 *(9.26)* ninth 6.33 *(10.19)* tenth 7.79 *(12.53)* eleventh 9.50 *(15.29)* twelfth 11.68 *(18.80)* thirteenth 13.54 *(21.79)* fourteenth 16.65 *(26.80)* fifteenth 20.31 *(32.69)* sixteenth 24.99 *(40.21)* reverse 1.32 *(2.12)*, 1.62 *(2.60)*, 1.97 *(3.17)*, 2.43 *(3.91)*, 3.11 *(5.01)*, 3.83 *(6.17)*, 4.68 *(7.53)*, 5.75 *(9.26)*, 6.33 *(10.19)*, 7.79 *(12.53)*, 9.50 *(15.29)*, 11.68 *(18.80)*, 13.54 *(21.79)*, 16.65 *(26.80)*, 20.31 *(32.69)*, 24.99 *(40.21)* **Clutch** multiple wet disc operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1980 engine rpm or 1000 rpm at 2000 engine rpm **Unladen tractor mass** 9720 lb *(4410 kg)*

# DRAWBAR PERFORMANCE

## (Unballasted - Front Drive Disengaged)

### MAXIMUM POWER IN SELECTED GEARS

| Power Hp *(kW)* | Drawbar pull lbs *(kN)* | Speed mph *(km/h)* | Crank-shaft speed rpm | Slip % | Fuel Consumption lb/hp.hr *(kg/kW.h)* | Hp.hr/gal *(kW.h/l)* | Temp.°F *(°C)* cool-ing med | Air dry bulb | Barom. inch Hg *(kPa)* |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 5th(2A) Gear | | | | | |
| 53.4 | 7315 | 2.74 | 2196 | 14.8 | 0.636 | 11.16 | 171 | 39 | 30.1 |
| *(39.8)* | *(32.5)* | *(4.40)* | | | *(0.387)* | *(2.20)* | *(77)* | *(4)* | *(102.0)* |
| | | | | 6th (2B) Gear | | | | | |
| 65.7 | 7080 | 3.48 | 2175 | 10.7 | 0.605 | 11.73 | 176 | 39 | 30.1 |
| *(49.0)* | *(31.5)* | *(5.60)* | | | *(0.368)* | *(2.31)* | *(80)* | *(4)* | *(102.0)* |
| | | | | 7th(2C) Gear | | | | | |
| 74.3 | 6845 | 4.07 | 2047 | 9.4 | 0.561 | 12.64 | 176 | 39 | 30.1 |
| *(55.4)* | *(30.5)* | *(6.55)* | | | *(0.341)* | *(2.49)* | *(80)* | *(4)* | *(102.0)* |
| | | | | 8th(2D) Gear | | | | | |
| 77.6 | 5830 | 4.99 | 1999 | 7.2 | 0.535 | 13.26 | 174 | 41 | 30.1 |
| *(57.9)* | *(25.9)* | *(8.03)* | | | *(0.325)* | *(2.61)* | *(79)* | *(5)* | *(102.0)* |
| | | | | 9th(3A) Gear | | | | | |
| 89.6 | 6105 | 5.50 | 2004 | 7.6 | 0.504 | 14.06 | 176 | 41 | 30.1 |
| *(66.8)* | *(27.2)* | *(8.86)* | | | *(0.307)* | *(2.77)* | *(80)* | *(5)* | *(102.0)* |
| | | | | 10th (3B) Gear | | | | | |
| 89.7 | 4910 | 6.85 | 1999 | 6.2 | 0.502 | 14.13 | 176 | 41 | 30.1 |
| *(66.9)* | *(21.8)* | *(11.03)* | | | *(0.305)* | *(2.78)* | *(80)* | *(5)* | *(102.0)* |
| | | | | 11th (3C) Gear | | | | | |
| 89.6 | 3985 | 8.43 | 2002 | 6.1 | 0.496 | 14.30 | 180 | 41 | 30.1 |
| *(66.8)* | *(17.7)* | *(13.57)* | | | *(0.302)* | *(2.82)* | *(82)* | *(5)* | *(102.0)* |

### TIRES AND WEIGHT

| | **Tested without ballast** |
|---|---|
| **Rear tires** - No.,size, ply & psi*(kPa)* | Two 18.4R38; **;15*(100)* |
| **Front tires** - No.,size, ply & psi*(kPa)* | Two 14.9R28; **;15*(100)* |
| **Height of Drawbar** | 31.5 in *(800 mm)* |
| **Static Weight with operator**- Rear | 6065 lb *(2750 kg)* |
| - Front | 3845 lb *(1745 kg)* |
| - Total | 9910 lb *(4495 kg)* |

## DRAWBAR PERFORMANCE

### (Unballasted - Front Drive Engaged)
### MAXIMUM POWER IN SELECTED GEARS

| Power Hp *(kW)* | Drawbar pull lbs *(kN)* | Speed mph *(km/h)* | Crank-shaft speed rpm | Slip % | Fuel Consumption lb/hp.hr *(kg/kW.h)* | Hp.hr/gal *(kW.h/l)* | Temp.°F*(°C)* cool-ing med | Air dry bulb | Barom. inch Hg *(kPa)* |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 4th(1D)Gear | | | | | |
| 52.3 *(39.0)* | 9285 *(41.3)* | 2.11 *(3.40)* | 2193 | 15.0 | 0.662 *(0.403)* | 10.71 *(2.11)* | 176 *(80)* | 43 *(6)* | 30.1 *(102.0)* |
| | | | | 5th(2A)Gear | | | | | |
| 66.4 *(49.5)* | 9060 *(40.3)* | 2.75 *(4.42)* | 2166 | 13.6 | 0.580 *(0.353)* | 12.23 *(2.41)* | 178 *(81)* | 43 *(6)* | 30.1 *(102.0)* |
| | | | | 6th (2B) Gear | | | | | |
| 75.5 *(56.3)* | 8475 *(37.7)* | 3.34 *(5.37)* | 2039 | 9.2 | 0.535 *(0.326)* | 13.25 *(2.61)* | 180 *(82)* | 43 *(6)* | 30.1 *(102.0)* |
| | | | | 7th(2C)Gear | | | | | |
| 80.6 *(60.1)* | 7350 *(32.7)* | 4.11 *(6.61)* | 2006 | 7.1 | 0.510 *(0.310)* | 13.91 *(2.74)* | 178 *(81)* | 43 *(6)* | 30.1 *(102.0)* |
| | | | | 8th(2D)Gear | | | | | |
| 81.0 *(60.4)* | 5910 *(26.3)* | 5.14 *(8.27)* | 2000 | 4.7 | 0.504 *(0.307)* | 14.06 *(2.77)* | 178 *(81)* | 45 *(7)* | 30.1 *(102.0)* |
| | | | | 9th(3A)Gear | | | | | |
| 92.5 *(69.0)* | 6135 *(27.3)* | 5.65 *(9.09)* | 2002 | 5.1 | 0.477 *(0.290)* | 14.87 *(2.93)* | 181 *(83)* | 45 *(7)* | 30.1 *(102.0)* |
| | | | | 10th (3B) Gear | | | | | |
| 92.4 *(68.9)* | 4915 *(21.9)* | 7.05 *(11.34)* | 2002 | 4.2 | 0.474 *(0.288)* | 14.97 *(2.95)* | 176 *(80)* | 46 *(8)* | 30.1 *(102.0)* |
| | | | | *11th (3C) Gear | | | | | |
| 91.9 *(68.5)* | 4095 *(18.2)* | 8.41 *(13.54)* | 2003 | 4.8 | 0.477 *(0.290)* | 14.87 *(2.93)* | 172 *(78)* | 46 *(8)* | 30.1 *(102.0)* |

*Front Drive Disengaged

| TRACTOR SOUND LEVEL WITH CAB | Front Wheel Drive Disengaged dB(A) | Front Wheel Drive Engaged dB(A) |
|---|---|---|
| At no load in 7th (2C) gear | 75.0 | 75.0 |
| Bystander | -- | -- |

| TRACTOR SOUND LEVEL WITHOUT CAB | Front Wheel Drive Disengaged dB(A) | Front Wheel Drive Engaged dB(A) |
|---|---|---|
| At no load in 7th (2C) gear | 85.0 | 85.0 |
| Bystander | -- | -- |

### TIRES AND WEIGHT

| | Tested without ballast |
|---|---|
| **Rear tires** - No.,size, ply & psi*(kPa)* | Two 18.4R38; **;15*(100)* |
| **Front tires** - No.,size, ply & psi*(kPa)* | Two 14.9R28; **;15*(100)* |
| **Height of Drawbar** | 19.7 in *(500 mm)* |
| **Static Weight with operator**- Rear | 6065 lb *(2750 kg)* |
| - Front | 3845 lb *(1745 kg)* |
| - Total | 9910 lb *(4495 kg)* |

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments

**NOTE 1:** The engine on this tractor is electronically controlled to give 2 power levels. A "boosted" level is available when the PTO is engaged, tractor stationary, and when the tractor is operated in ranges 3 and 4.

**NOTE 2:** The performance figures on this report are the result of replacing the electronic engine control module of the Massey Ferguson 5445 with the Massey Ferguson 5455 module.

**NOTE 3:** The performance figures on this report apply to tractors with chassis S/N T022073 and higher.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD test procedures. This tractor did not meet the manufacturer's claim of 26 GPM *(100 lpm)* hydraulic flow at the remote outlets. The performance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **2516**, Nebraska Summary 705, September 8, 2010.

Roger M. Hoy
Director

M.F. Kocher
D.R. Keshwani
J.A. Smith
Board of Tractor Test Engineers

## HYDRAULIC PERFORMANCE

CATEGORY: II
Quick Attach: None
OECD Static test
Maximum force exerted through whole range: 7817 lbs *(34.8 kN)* (66 mm lift cylinders)
9189 lbs *(40.9 kN)* (75 mm lift cylinders)

| | Open center system | | Closed center system |
|---|---|---|---|
| | 100 l/min pump | 57 l/min pump | 110 l/min pump |
| i) Sustained pressure of the open relief valve: | 3136 psi *(216 bar)* | 2785 psi *(192 bar)* | 2848 psi *(196 bar)* |
| ii) Pump delivery rate at minimum pressure: | 24.1 GPM *(91.2 l/min)* | 16.1 GPM *(61.0 l/min)* | 29.8 GPM *(112.7 l/min)* |
| iii) Pump delivery rate at maximum hydraulic power: | 22.4 GPM *(84.8 l/min)* | 14.7 GPM *(55.5 l/min)* | 24.2 GPM *(91.6 l/min)* |
| Delivery pressure: | 2338 psi *(161 bar)* | 2580 psi *(178 bar)* | 2708 psi *(187 bar)* |
| Power: | 30.6 HP *(22.8 kW)* | 22.1 Hp *(16.4 kW)* | 38.2 hp *(28.5 kW)* |

## THREE POINT HITCH PERFORMANCE

| | |
|---|---|
| Observed Maximum Pressure psi. *(bar)* | 2770 *(191)* |
| Location: | lift cylinder |
| Hydraulic oil temperature: °F *(°C)* | 152 *(67)* |
| Location: | hydraulic valve |
| Category: | II |
| Quick attach: | none |

66 mm cylinders

**SAE Static Test**—System pressure 2490 psi *(172 Bar)*

| | | | | | |
|---|---|---|---|---|---|
| Hitch point distance to ground level in. *(mm)* | 9.9 *(251)* | 15.0 *(381)* | 22.0 *(559)* | 29.0 *(737)* | 36.0 *(914)* |
| Lift force on frame lb | 15561 | 12897 | 11745 | 10314 | 9126 |
| " " " " " " *(kN)* | *(69.2)* | *(57.4)* | *(51.0)* | *(45.9)* | *(40.6)* |

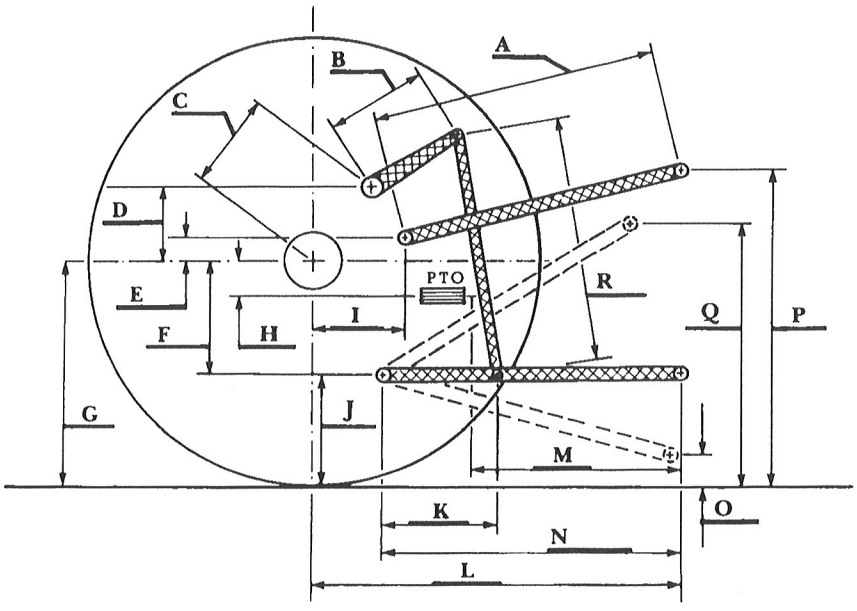
75 mm cylinders

**SAE Static Test**—System pressure 2490 psi *(172 Bar)*

| | | | | | |
|---|---|---|---|---|---|
| Hitch point distance to ground level in. *(mm)* | 10.2 *(259)* | 15.0 *(381)* | 22.0 *(559)* | 29.0 *(737)* | 36.0 *(914)* |
| Lift force on frame lb | 18747 | 15849 | 14310 | 12789 | 11421 |
| " " " " " " *(kN)* | *(83.4)* | *(70.5)* | *(63.7)* | *(56.9)* | *(50.8)* |

**HITCH DIMENSIONS AS TESTED—NO LOAD**

| | SAE test | | OECD test | |
|---|---|---|---|---|
| | inch | *mm* | inch | *mm* |
| A | 24.8 | *629* | 24.8 | *629* |
| B | 11.6 | *295* | 11.6 | *295* |
| C | 13.9 | *353* | 13.9 | *353* |
| D | 13.0 | *330* | 13.0 | *330* |
| E | 7.9 | *200* | 7.9 | *200* |
| F | 10.2 | *260* | 10.2 | *260* |
| G | 30.3 | *770* | 30.3 | *770* |
| H | 1.4 | *35* | 1.4 | *35* |
| I | 16.2 | *413* | 16.2 | *413* |
| J | 20.1 | *510* | 20.1 | *510* |
| K | 24.2 | *615* | 24.2 | *615* |
| L | 41.2 | *1046* | 41.2 | *1046* |
| M | 23.5 | *596* | 23.5 | *596* |
| N | 37.2 | *946* | 37.2 | *946* |
| O | 8.0 | *203* | 8.0 | *203* |
| P | 40.2 | *1020* | 44.1 | *1120* |
| Q | 33.5 | *850* | 33.5 | *850* |
| R | 29.0 | *737* | 29.0 | *737* |

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